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Ciba Specialty Chemicals Corporation
North America

Corporate
Remediation Services

Ciba

September 19, 2002

Mr. Frank Battaglia
USEPA Region III
Office of Site Remediation and Restoration (HBT)
JFK Federal Building
Boston, MA 02203

Re: Cranston, RI
Final Stabilization (Thermal Oxidizer/SVE Shutdown)

Dear Mr. Battaglia

The Soil Vacuum Extraction (SVE)/Thermal Oxidizer has operated continually for approximately eighteen months. This proposal is in response to our March 2001 meeting where we discussed the SVE system, the criteria for tracking effectiveness, and ultimately the criteria for shutting down this system.

Proposal/Request:
The Revised Final Stabilization Design Documents dated January 1995; Section 4.2.2.3 indicates the stabilization performance standard for SVE is to significantly reduce the levels of VOCs in the soil gas at SWMU-11. A significant reduction is defined as the decrease in the VOC concentrations (most notable toluene) in the soil gas from its initial (or start-up) concentration until the concentrations remain statistically flat for a six-month period based on monthly sampling data. A second stabilization performance standard for the SVE system is to lower the groundwater level in the SWMU-11 area so that more soil could be exposed and influenced by the SVE system. There are no quantitative stabilization standards for the SVE system.

* 95% CONFIDENCE LIMIT
PROPOSED 3 STANDARD DEVIATIONS

The determining factors for operational time are dependant on the extraction rate of TVOC, and their rate of decline. Ciba requests that after sustaining a statistically flat rate whereby concentrations do not vary from the mean by 3 standard deviations for a six month period the SVE system will be shutdown for a 30 day period. The mean, in this case, is defined as the arithmetic mean calculated from a minimum number of five consecutive samples collected once a plot indicates apparent leveling. After the 30-day shutdown period, Ciba will re-start SVE and supporting equipment in order to measure potential rebounding effects. Weekly samples will then be taken for a 30 day run period. The last two samples will be used to determine whether the statistical flat line that was indicated prior to shutdown was reestablished. If the concentrations of these two samples are within 3 standard deviations (+/-) of the mean calculated from earlier data, the system will be considered to have met it's operational requirements, and if approved by EPA, will be permanently shutdown, dismantled, and removed from the site. If the system fails to meet the above criteria within the 30 day assessment period, the system will continue to operate for an additional three months utilizing the same criteria for determining the initial mean or flat rate prior to shutdown. Following the three month run period at a statistically flat rate the system will be shutdown for an additional 30 days, and then re-started for the second time and additional rebound monitoring will be performed. If the rebound returns to the statistically flat rate (3 standard deviations) within a 30 day run period, the system will be shutdown, dismantled, and removed as noted earlier. If the system fails to return to the statistically flat rate within 30 days, the prior rebounding steps will be repeated until the objectives are meet.

PAST SAMPLES

?

CONTINUE TO PUMP WELLS

?

* MASS REMOVAL RATHER THAN CONC. FOR SHUTDOWN

Based on the Revised Final Stabilization Design Documents dated January 1995, and discussions from our March 2001 meeting, Ciba utilized the following criteria for tracking operational performance.

- Monthly influent vapor sampling to the thermal oxidizer
- Monthly SVE groundwater influent samples

Oak Ridge Parkway
P.O. Box 71
Toms River, NJ 08754-0071
Tel. 732 914 2500

- Quarterly groundwater sampling of VE1, 2, 3, 7, 9, 10, 11
- Conducted periodic water level elevations and vacuum measurements in monitoring wells VE4, 5, 6, 8, P4S, MW4S

As noted and agreed upon at our March 2001 meeting, the existing criteria for measuring vacuum/flow effect (1 mm or 0.04 in. Hg and 0.8 l/min) in the monitoring wells (VE4, 5, 6, 8, P4S, MW4S) that surround the SVE wells (VE1, 2, 3, 7, 9, 10, 11) was extremely difficult at low air flow and that monitoring would be accomplished through vacuum readings (1 mm or 0.04 Hg) only.

History:
To date, Ciba operated the Thermal Oxidizer/SVE equipment on a continual basis since start up in October 2000. Ciba realizes that the determining factors for operational time is dependent on the extraction rate of TVOC, their rate of decline, and EPA's approval to cease SVE operations.

The new Thermal Oxidizer and SVE was installed and put into operation in October 2000. The system operated in a shakedown mode through December 2000. During this period all operating systems were checked and minor system modifications made as necessary to insure safety and proper operating parameters to effectively remove TVOC's. In addition, Destruction Efficiency / Performance Testing was completed in October 2000.

At start-up, on October 13, 2000, the TVOC influent (vapor) concentration from VE-11 to the oxidizer was 200PPM. At that time, additional analyses indicated that the stack outlet and the water influent readings were in the range of 15PPB and 19PPM respectively. After the startup and shakedown period, and with all VE wells on-line, a significant steady decrease of TVOC to the Thermal Oxidizer was noticed over time. During the first five-month period (10/13/00 to 03/01/01) the TVOC inlet dropped from 200ppm to 2ppm. For the next nine months (03/01/01 through 12/10/01) the inlet TVOC leveled off with monthly analyses varying between 11.9 ppm and 1.7 ppm. However, in January of 2002 analyses indicated a significant decrease in the inlet TVOC to the system. For the period of January 01, 2002 through July 01, 2002, all analyses ranged between 701 ppb and 282 ppb. This indicates that SVE was successful in the removal of mass, and that a steady state was achieved as intended.

START-UP

6 MO

Actual tracking of the TVOC processed through the SVE/Thermox system was initiated in March 2001. Since March 2001 through December 2001 approximately 467 pounds of VOC were effectively removed and treated by the SVE/Thermal Oxidizer system. For the period of January 2002 through July 2002, only 42 pounds were removed. In total, 509 pounds of TVOC have been effectively removed and treated since tracking was initiated in March 2001.

In order to enhance extraction of TVOC vapors in the SWMU-11 area, additional soils were exposed to the effects of vacuum by pumping water form the SVE wells at a rate of 12 gpm, which lowered the water levels in the SWMU- 11 vacuum extraction wells approximately five feet. The TVOC in the extracted groundwater ranged between 6.1 ppm and 19.2 ppm since March 2001.

Periodic readings were taken measuring vacuum effect (1 mm or 0.04 Hg) in the SWMU #11 area. Monitoring vacuum wells included VE-4, 5, 6, 8, P4S, and MW4S as indicated in Attachment 1 Figure 1. A vacuum greater than 0.25" of water was consistently measured at locations VE-4 and VE-5. A vacuum in the range of 0.05" of water was measured at wells MW4-S and MW4D. Vacuum was not detected at levels above .01"of water at wells VE-6, 8, and P-4S. However, due to the fact that these three wells are located outside the former production building foundation may be responsible for the lack of detectable vacuum or that readings are below the detection level of the monitoring instrument.

Attachment 2 is a chart that indicates downward trending of TVOC to the SVE/Thermal Oxidizer system since the October 2000 start-up of SVE.

Attachment 3 is a chart (SVE Cranston Standard Deviation), which indicates pounds extracted monthly for calculating the standard deviation. The actual + or – three standard deviations currently calculates to a mean of 6.33 lb. With a standard deviation of 2.88 lb., the range or criteria for a test shutdown would be less 14.96 lb. extracted in any given month during a consecutive six-month run period. Currently SVE is meeting the proposed criteria for rebound testing. If EPA approves the proposed criteria for SVE shutdown, Ciba will commence with a one-month shutdown of SVE. Then re-start SVE and follow the prescribed sampling plan and other necessary criteria as outlined in the proposal/request.

SEEMS LIKE A LARGE % OF MEAN

Conclusions and Recommendations:
Ciba believes that the foregoing data supports a conclusion that requirements established in the Revised Final Stabilization Design Documents dated January 1995, have been fully met.

Ciba respectfully requests EPA approval of the SVE termination criteria provided herein.

Thank you for meeting with Ciba in order to discuss this matter and I look forward to your early response.

Sincerely,

Robert McNabb
Off-Site Operations Manager

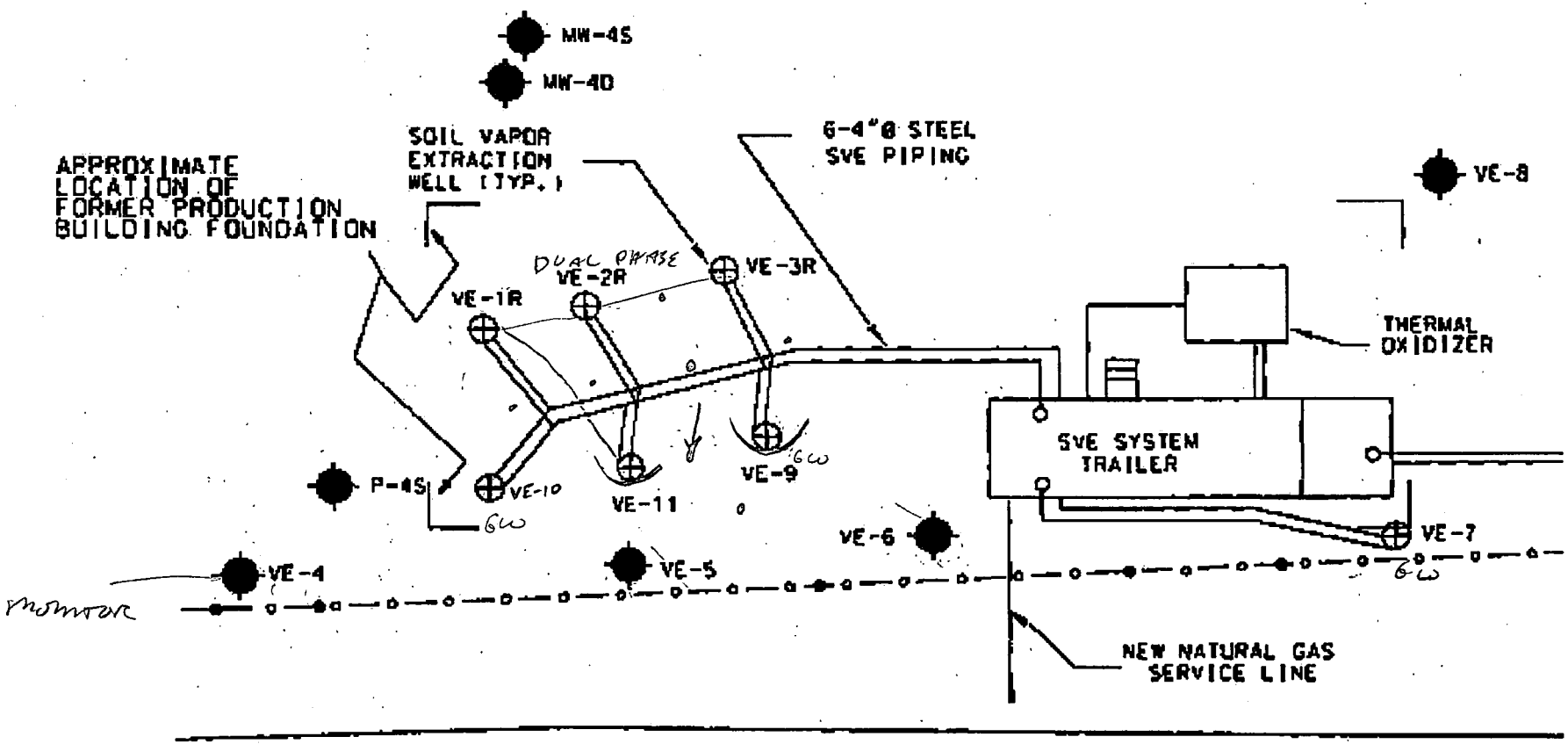
Attachments:

cc:

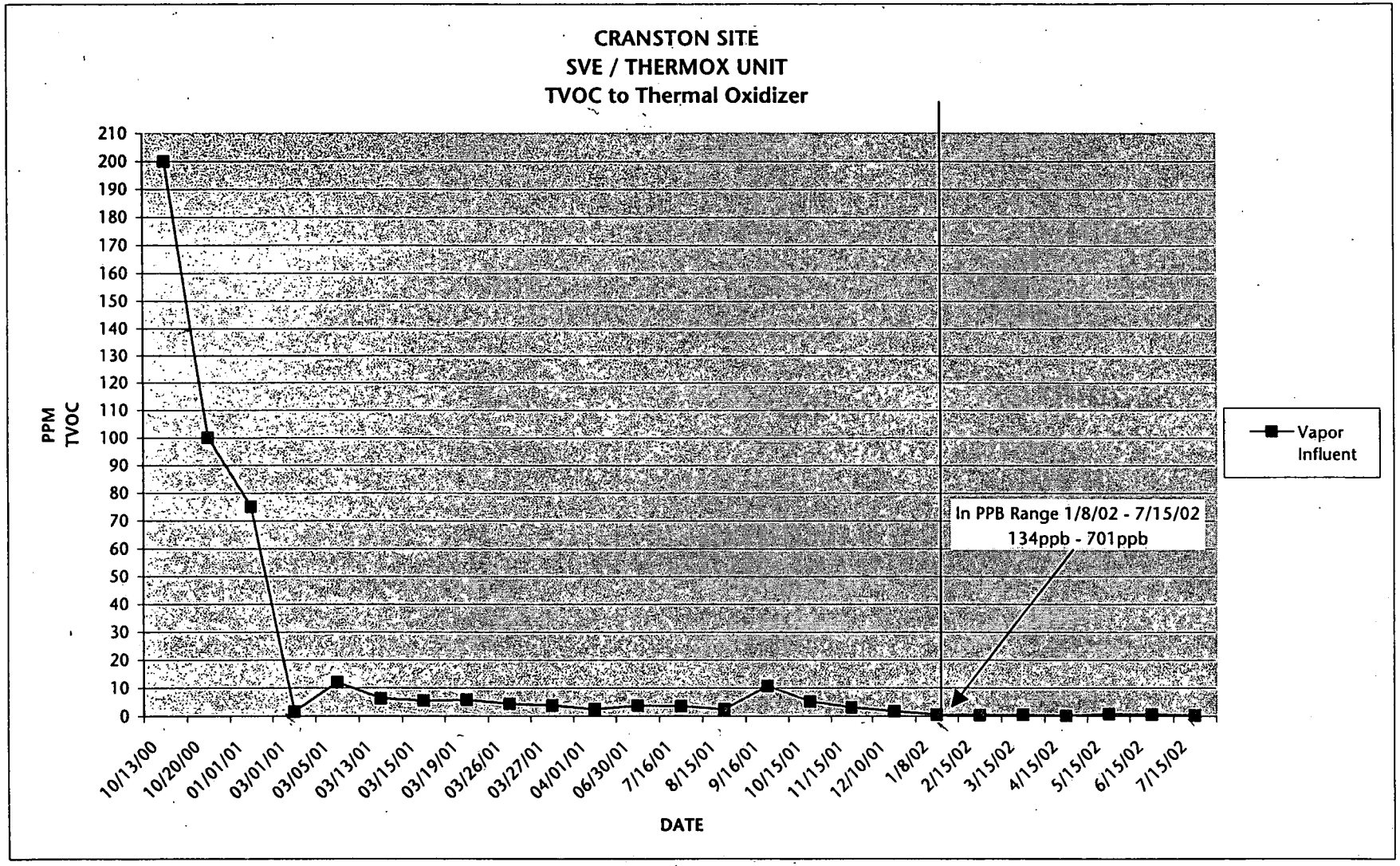
K. Dupuis	Ciba
D. Williams	Ciba
B. Cohen	Ciba
D. Ellis	Ciba
R. Youhas	Ciba
M. Bradely	RIDEM
F. Battaglia (3)	Region III EPA
Ciba File	

ATTACHMENT 1 FIGURE 1 (SVE Monitoring Wells)

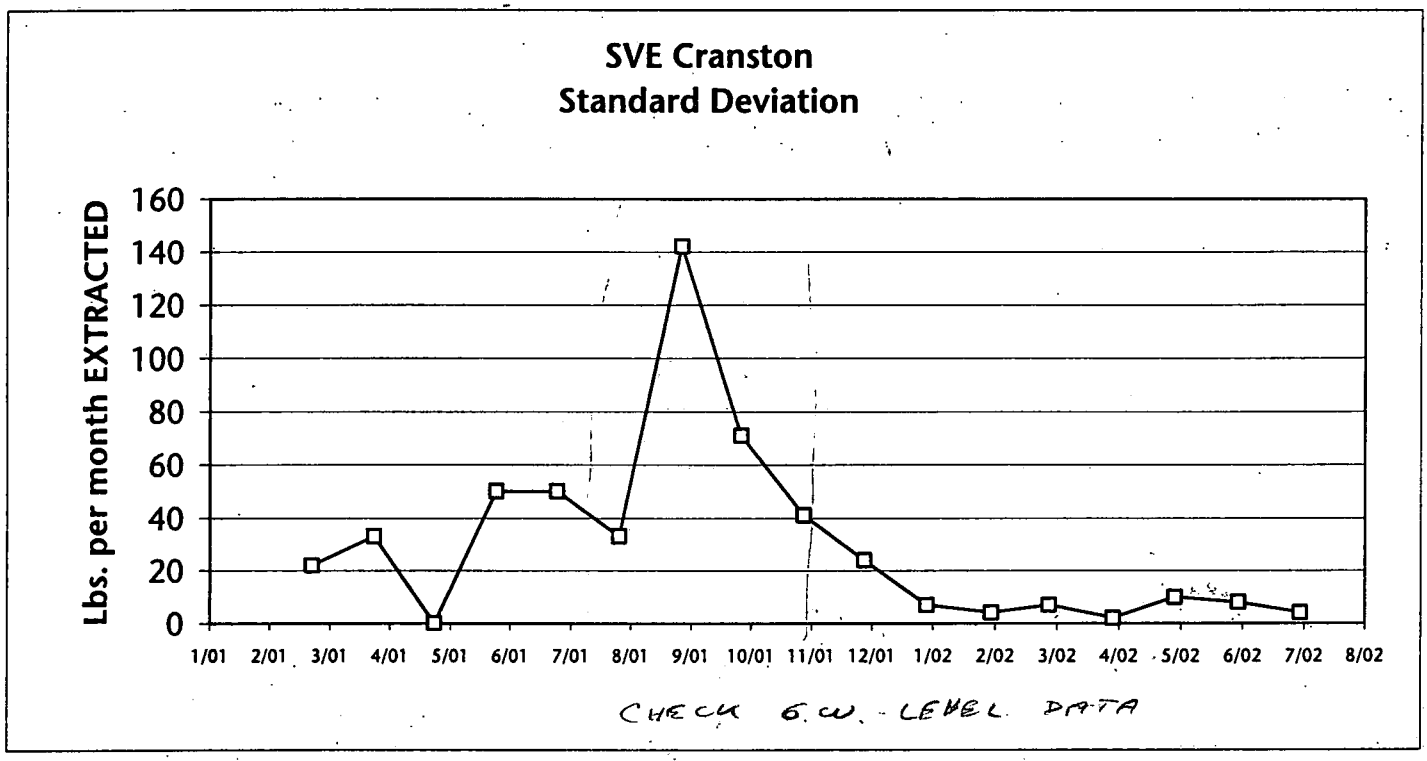
⊕ = SOIL SAMPLES



ATTACHMENT 2 (Monthly TVOC to Thermal Oxidizer)



ATTACHMENT 3 (Cranston SVE Standard Deviation)



January-01	1	
February-01	2	
March-01	3	22
April-01	4	33
May-01	5	
June-01	6	50
July-01	7	50
August-01	8	33
September-01	9	142
October-01	10	71
November-01	11	41
December-01	12	24
January-02	13	7
February-02	14	4
March-02	15	7
April-02	16	2
May-02	17	10
June-02	18	8
July-02		
August-02		
September-02		
October-02		
November-02		

Standard Deviation/6month period

7	
4	
7	
2	
10	
8	
6.33	mean
2.88	std dev
14.96	mean+3 std dev.
-2.29	mean-3 std dev.